## **REMARKS**

Claims 1-11 are pending in the application and were examined and reported in the Office Action. Claims 1-4 are rejected. Claims 3 and 5-11 are canceled. Claims 1,2 and 4 are amended. New claim 12 is added. The amendments to claim 1 are described in the specification and illustrated in Figure 6. No new matter has been added. Claims 1, 2, 4 and 12 remain.

Applicant requests reconsideration of the application in view of the following remarks.

# I. 35 U.S.C. §103(a)

**A.** It is asserted in the Office Action that claims 1 and 4 are rejected under 37 U.S.C. §103(a) as being unpatentable over US Patent No. 6,242, 787 issued to Nakayama et al. ("Nakayama") in view of Applicant's admitted prior art ("AAPA"). Applicant respectfully disagrees.

Applicant's amended claim 1 contains the limitations of "[a]n HF power device in an HF transistor, comprising: ... a sinker as the first conductive type provided as a column shape of a plurality of trenches for dividing into two source areas and directly connecting the source area and the first semiconductor layer by piercing through the source area and the second semiconductor layer ..."

In other words, a sinker is formed on a source area by piercing through the source area and the second semiconductor layer. That is, the source area is directly connected to the first semiconductor layer by the sinker having a column shape of a plurality of trenches as shown in following drawing.

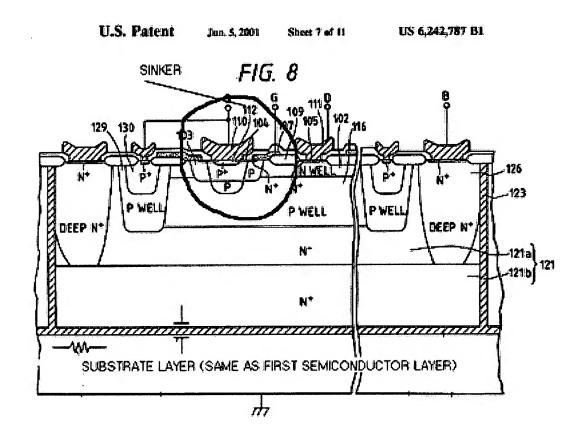
# FIG. 6 FIG. 6 FIG. 6 FIG. 6 FIG. 5 FIG. 5

According to MPEP \$2142 "[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Further, according to MPEP \$2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." "All words in a claim must be considered in judging the patentability of that claim against the prior art." (In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

<u>Nakayama</u> discloses a semiconductor device including a reduced surface field strength type MOS transistor (LDMOS) that prevents the breakdown of elements at channel formation portions when a reverse voltage is applied to its drain. Distinguishable from Applicant's claimed invention, in <u>Nakayama</u>, a sinker is formed

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by P+ and P regions of a source area, and the source area is electrically connected through the PN diode to the substrate layer. In other words, the trench structure is <u>not</u> <u>directly connected to the substrate layer</u> as shown below in Figure 8 of <u>Nakayama</u>.



Further, Nakayama does not teach, disclose or suggest "a sinker as the first conductive type provided as a column shape of a plurality of trenches for dividing into two source areas and directly connecting the source area and the first semiconductor layer by piercing through the source area and the second semiconductor layer."

It is asserted in the Office Action that <u>AAPA</u> discloses an LDD area as a second conductive type formed on the surface of the semiconductor layer between the drain area and the gate electrode. <u>AAPA</u>, however, does not teach, disclose or suggest "a sinker as the first conductive type provided as a column shape of a plurality of trenches for dividing into two source areas and directly connecting the source area and the first semiconductor layer by piercing through the source area and the second semiconductor layer."

Since neither <u>Nakayama</u>, <u>AAPA</u>, or the combination of the two teach, disclose or suggest the limitations contained in Applicant's amended claim 1, as listed above, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's amended claim 1 is not obvious over <u>Nakayama</u> in view of <u>AAPA</u> since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claim that directly depends from amended claim 1, namely claim 4, would also not be obvious over <u>Nakayama</u> in view of <u>AAPA</u> for the same reason.

Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection for claims 1 and 4 are respectfully requested.

**B.** It is asserted in the Office Action that claims 2 and 3 are rejected under 35 U.S.C. §103(a) as being unpatentable over <u>Nakayama</u> and <u>AAPA</u> as applied to claim 1, and further in view of U.S. Patent No. 6,326,656 issued to Tihanyi ("<u>Tihanyi</u>"). Applicant respectfully disagrees.

Applicant's claims 2 and 3 depend on amended claim 1. Applicant discussed Nakayama in view of AAPA regarding claim 1 above in section I(A).

<u>Tihanyi</u> discloses a lateral high-voltage transistor that has a semiconductor body made of a lightly doped semiconductor substrate of a first conductivity type and the epitaxial layer is made of a second conductivity type. <u>Tihanyi</u> also discloses the transistor includes trenches between the source electrode and the drain electrode. The walls of these trenches are highly doped with dopants of the first conductivity type.

<u>Tihanyi</u>, however, does not teach, disclose or suggest "a sinker as the first conductive type provided as a column shape of a plurality of trenches for dividing into two source areas and directly connecting the source area and the first semiconductor layer by piercing through the source area and the second semiconductor layer."

Since neither <u>Nakayama</u>, <u>AAPA</u>, <u>Tihanyi</u>, or the combination of the three teach, disclose or suggest the limitations contained in Applicant's amended claim 1, as listed above, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's amended claim 1 is not obvious over <u>Nakayama</u> and <u>AAPA</u> in view of <u>Tihanyi</u> since a *prima facie* case of obviousness has not been met under MPEP §2142.

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Additionally, the claims that directly or indirectly depend from amended claim 1, namely claims 2-3, would also not be obvious over <u>Nakayama</u> and <u>AAPA</u> in further view of <u>Tihanyi</u> for the same reason.

Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection for claims 2 and 3 are respectfully requested.

# **CONCLUSION**

In view of the foregoing, it is believed that all claims now pending, namely 1, 2, 4 and 12, patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

### PETITION FOR EXTENSION OF TIME

Per 37 C.F.R. 1.136(a) and in connection with the Office Action mailed on April 22, 2004, Applicant respectfully petitions the Commissioner for a two (2) month extension of time, extending the period for response to Wednesday, September 22, 2004. The Commissioner is hereby authorized to charge payment to Deposit Account No. 02-2666 in the amount of \$210.00 to cover the petition filing fee for a 37 C.F.R. 1.17(a)(2) small entity. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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Dated: September 16, 2004

Ву

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### CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia 22313-1450 on September 16, 2004.

Tean Syoboda